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**Filed : August 22, 2000**

### **REMARKS**

The foregoing amendments to the specification and claims and the following remarks are responsive to the November 10, 2003 Office Action.

Claims 1-29 were originally filed in this application. In the Office Action, the Examiner objects to the Abstract as exceeding 150 words in length. The Examiner also rejects Claims 1-29. In particular, the Examiner rejects Claims 28-29 under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner rejects Claims 1-3, 5, 9-11, 22, 24, and 25-28 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,381,659 to Proch et al. ("the Proch patent") in view of U.S. Patent No. 6,490,635 to Holmes ("the Holmes patent"). The Examiner rejects Claims 4, 6-7 and 23 under 35 U.S.C. § 103(a) as being unpatentable over Holmes in view of Proch and in further view of Official Notice taken by the Examiner. The Examiner rejects Claims 12, 18-20, 22 and 24-27 under 35 U.S.C. § 102(e) as being anticipated by Holmes. The Examiner rejects Claims 13-17 under 35 U.S.C. § 103(a) as being unpatentable over Holmes in view of U.S. Patent No. 5,729,718 to Au ("the Au patent").

The Examiner objects to Claim 29 but indicates that Claim 29 would be allowable if rewritten to overcome the rejection under 35 U.S.C. § 112, second paragraph, and to include all the limitations of the base claim and any intervening claims.

In response to the rejections, Applicants have cancelled Claims 8, 18-21 and 23 and have amended Claims 1, 12, 22 and 24-29. Claims 2-7, 9-11 and 13-21 remain as originally filed. Thus, Claims 1-7, 9-17, 22 and 24-29 are presented herein for further consideration in view of the amendments and the following remarks. For the reasons presented below, Applicants respectfully submit that Claims 1-7, 9-17, 22 and 24-29 are now in condition for allowance, and Applicants respectfully request allowance of Claims 1-7, 9-17, 22 and 24-29.

#### **Response to the Objection to the Abstract**

The Examiner objects to the Abstract as exceeding 150 words in length. Applicants have cancelled the original Abstract and have submitted a substitute Abstract to comply with the Examiner's request. Because of the number of changes,

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Applicants have not included a marked-up version of the abstract. Rather, as recommended in the *Changes To Implement Electronic Maintenance of Official Patent Application Records*, Final Rule, 68 Fed Reg 38611 at 38616 (June 30, 2003), only a clean form of the substitute abstract is being provided on a replacement sheet in accordance with 37 C.F.R. § 1.121 and 37 C.F.R. § 1.72(b). Applicants respectfully request approval of the substitute Abstract submitted herein.

#### **Amendment to the Specification**

While reviewing this application in connection with the preparation of this response, an error was discovered on page 14 of the specification wherein a reference to Figure 5 was inadvertently identified as a reference to Figure 4. In view of the context of the reference, the figure number should clearly be changed to --5--. Thus, no new matter is introduced by the requested amendment to the specification. Applicants respectfully request approval of the amendment to the specification.

#### **Allowable Subject Matter—Amended Claim 29**

The Examiner indicates that Claim 29 would be allowable if rewritten to overcome the rejection under 35 U.S.C. § 112, second paragraph, and to include the limitations of the base claim and any intervening claims. Claim 29 originally depended directly from independent Claim 28. In accordance with the indication of allowability, Applicants have rewritten Claim 29 herein as an independent claim. Amended Claim 29 includes all the limitations of original Claim 28 and original Claim 29. In addition, Claim 29 is amended in response to the rejection under 35 U.S.C. § 112, second paragraph, to consistently refer to the --buffer memory-- instead of the "the controller" at the locations identified by the Examiner. The elements added to Claim 29 from Claim 28 are also revised in response to the rejection under 35 U.S.C. § 112, second paragraph. Note that the definition of the microprocessor has been relocated in Claim 29 to clarify the claim. In view of the Examiner's indication of allowability of Claim 29, Applicants respectfully submit that amended Claim 29 is now in condition for allowance. Applicants respectfully request allowance of Claim 29.

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**Response to Rejection of Claim 28 Under 35 U.S.C. § 112, Second Paragraph**

The Examiner rejects Claim 28 under 35 U.S.C. § 112, second paragraph as being indefinite. In response, Applicants have replaced "the controller" with --the buffer memory-- at the identified location in Claim 28 to clarify Claim 28. In addition, the definition of the microprocessor has been relocated in Claim 28 to clarify the claim. Applicants respectfully submit that amended Claim 28 now conforms with the requirements of 35 U.S.C. § 112, second paragraph, and Applicants respectfully request allowance of amended Claim 28.

**Response to Claim Rejections Under 35 U.S.C. § 102(e)**

**Claim 12**

The Examiner rejects Claim 12 as being anticipated by Holmes. For the reasons set forth below, Applicants respectfully submit that amended Claim 12 is patentably distinguished over the cited reference.

One aspect of the claimed invention, as recited in amended Claim 12, is a method for operating a hard disk unit. The method comprises receiving a first write operation and a second write operation. A single command is then received to transfer to a disk formatter the data from each write operation. This data is subsequently written to a disk in an order other than the order in which the write operations were initially received.

Holmes does not teach or suggest the method as recited in amended Claim 12. In particular, Holmes does not appear to teach receiving a single command to transfer to a disk formatter the data of multiple write operations, wherein the data is written in an order other than the order in which the data was received by the hard disk unit. Rather, Holmes is directed to a conflict detection method for a disk drive controller. When an address range overlap exists between queued commands, a flag is set that restricts command reordering. In particular, the method in Holmes includes: (1) looking for an address range overlap between a newly received write command and other queued commands (read or write), (2) setting a conflict flag if an overlap exists, and (3)

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restricting reordering until the conflict has been cleared. Holmes does not appear to teach a method for writing the data to a disk.

For at least the foregoing reasons, Applicants respectfully submit that Holmes does not teach or suggest the invention defined in amended Claim 12. Therefore, Claim 12 is patentably distinguished over the cited reference. Applicants respectfully request the Examiner to withdraw the rejection of Claim 12 under 35 U.S.C. § 102(e) and to pass Claim 12 to allowance.

#### **Claims 22 and Claims 24-27**

The Examiner rejects Claims 22 and 24-27 under 35 U.S.C. § 102(e) as being anticipated by Holmes. Claims 22 and 24-27 are also rejected by the Examiner under 35 U.S.C. § 103(a) as being unpatentable over Proch in view of Holmes. For the reasons presented below, Applicants respectfully submit that Claims 22 and 24-27 are patentably distinguished over the cited combination of Proch and Holmes. Therefore, Claims 22 and 24-27 are not anticipated by Holmes. Applicants respectfully request the Examiner to withdraw the rejection of Claim 22 and 24-27 under 35 U.S.C. § 102(e)

#### **Response to Claim Rejections Under 35 U.S.C. § 103(a)**

##### **Claims 1-7 and 9-11**

The Examiner rejects independent Claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Proch in view of Holmes. For the reasons set forth hereafter, Applicants respectfully submit that amended Claim 1 and dependent Claims 2-7 and 9-11 are patentably distinguished over the cited references.

One aspect of the claimed invention, as recited in amended Claim 1, is a buffer memory controller comprising a data buffer, a plurality of address registers, and controller logic. Each address register is configured to store an address of write operation data stored in a buffer memory. In addition, the controller logic is configured to transfer, based on a single command, the data of at least two write operations in an order other than the order in which the two write operations were received by the buffer memory. This allows for out-of-order execution of write operations wherein the data of

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multiple write operations is transferred in response a single command from a processor. For example, in one embodiment of the claimed invention, the two write operations can be executed out of order during a single revolution of the hard disk.

Neither Proch nor Holmes nor a combination of Proch and Holmes teaches or suggests a buffer memory controller as recited in amended Claim 1. In particular, neither reference teaches a buffer memory controller having controller logic configured to, in response to a single command, transfer data from a plurality of write operations, wherein the data is transferred in an order other than the order in which the data was received by the buffer memory.

Proch discloses a method and circuit for controlling a first-in first-out ("FIFO") buffer such that the buffer can accommodate multiple data blocks simultaneously without overlapping data between adjacent data blocks. In particular, Proch teaches the use of registers (148, 152a-b and 154a-b) to store the beginning addresses and ending addresses of data in the FIFO buffer 144 (see column 6 at line 47 through column 7 at line 22). Proch appears to teach away from out-of-order execution of write operations because the data from the write operations is sequentially written to the FIFO buffer 144 (see column 10 at lines 46-48), which FIFO buffer maintains the sequence of the write operation data as the data is transferred out. In addition, the registers (148, 152a-b and 154a-b) of Proch could not be used for out-of-order transferring of write operations from a buffer memory to a data buffer because the registers are configured store the addresses of data in the FIFO buffer 144, not the addresses of data stored in a buffer memory that is to be transferred to the FIFO buffer.

As discussed previously with reference to Claim 12, Holmes also does not teach receiving a single command to transfer the data of multiple write operations, wherein the data is transferred from a buffer memory in an order other than the order in which the data was received by the buffer memory. In addition, Holmes does not appear to disclose the use of a plurality of address registers, as recited in Claim 1, to store addresses of data stored within a buffer memory.

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For at least the foregoing reasons, Applicants respectfully submit that no combination of Proch and Holmes teaches or suggests the invention defined in amended Claim 1. Therefore, Claim 1 is patentably distinguished over the cited references. Applicants respectfully request the Examiner to withdraw the rejection of Claim 1 and to pass Claim 1 to allowance.

Claims 2-7 and 9-11 depend from independent Claim 1 and further define the invention defined in Claim 1. Claims 2-7 and 9-11 are patentably distinguished over the cited references for at least the reasons set forth above with respect to the patentability of Claim 1. Claims 2-7 and 9-11 are further patentably distinguished over the cited references in view of the additional limitations recited in Claims 2-7 and 9-11. Applicants respectfully request allowance of Claims 2-7 and 9-11.

**Claims 13-17**

The Examiner rejects Claim 13-17 under 35 U.S.C. § 103(a) as being unpatentable over Holmes in view of Au.

Claims 13-17 depend from independent Claim 12 and further define the invention defined in Claim 12. Claims 13-17 are patentably distinguished over the cited references for at least the reasons set forth above with respect to the patentability of Claim 12. Claims 13-17 are further patentably distinguished over the cited references in view of the additional limitations recited in Claims 13-17. Applicants respectfully request allowance of Claims 13-17.

**Claim 22**

The Examiner rejects independent Claim 22 under 35 U.S.C. § 103(a) as being unpatentable over Proch in view of Holmes.

Amended independent Claim 22 includes limitations similar to the limitations of Claim 1. Applicants submit that Claim 22 is patentably distinguished over the cited references for reasons set forth above with respect to Claim 1. Claim 22 includes other limitations in combination with the previously discussed limitations. The cited references do not teach or suggest the recited combination of limitations in Claim 22. Thus, Claim 22 is further patentably distinguished over the cited references in view of

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the defined combination of limitations. Applicants respectfully submit that Claim 22 is patentably distinguished over the cited references, and Applicants respectfully request allowance of Claim 22.

In view of the patentability of Claim 22 under 35 U.S.C. § 103(a), Applicants respectfully submit that Claim 22 is also patentable under 35 U.S.C. § 102(e).

**Claims 24–27**

The Examiner rejects Claims 24–27 under 35 U.S.C. § 103(a) as being unpatentable over Proch in view of Holmes.

Amended independent Claim 24 includes limitations similar to the limitations of Claim 12. Applicants submit that Claim 24 is patentably distinguished over the cited references for reasons set forth above with respect to Claim 12. The cited references do not teach or suggest the recited combination of limitations in Claim 22. Thus, Claim 22 is further patentably distinguished over the cited references in view of the defined combination of limitations. Applicants respectfully submit that Claim 22 is patentably distinguished over the cited references, and Applicants respectfully request allowance of Claim 22.

Claims 25–27 depend from independent Claim 24 and further define the invention defined in Claim 24. Claims 25–27 are patentably distinguished over the cited references for at least the reasons set forth above with respect to Claim 24. Claims 25–27 are further patentably distinguished over the cited references in view of the additional limitations recited in Claims 25–27. Applicants respectfully request allowance of Claims 24–27.

**Claim 28**

The Examiner rejects independent Claim 28 as being unpatentable over Proch in view of Holmes.

Claim 28 is amended herein to clarify features of Claim 28 and to overcome the rejection of Claim 28 under 35 U.S.C. § 112, second paragraph. Applicants respectfully submit that the amendments to Claim 28 are only for clarification and do not change the scope of Claim 28. Original Claim 28 included features that are now in amended Claim

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28 and that are similar to limitations of Claim 1. Applicants respectfully submit that Claim 28 is patentably distinguished over the cited references for reasons set forth above with respect to Claim 1. Claim 28 includes other limitations in combination with the previously discussed limitations. The cited references do not teach or suggest the recited combination of limitations in Claim 28. Thus, Claim 28 is further patentably distinguished over the cited references in view of the defined combination of limitations. Applicants respectfully submit that Claim 28 is patentably distinguished over the cited references, and Applicants respectfully request allowance of Claim 28.

### Summary

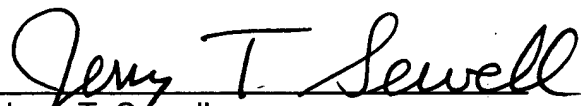
In view of the foregoing amendments and the foregoing remarks, Applicants respectfully submit that the present application is now in condition for allowance, and Applicants respectfully request allowance of Claims 1-3, 5, 9-11, 22 and 24-29. If further issues remain to be resolved, Applicants' undersigned attorney of record hereby formally requests a telephone interview with the Examiner. Applicants' attorney can be reached at 949-721-2849 or at the general office number listed below.

Respectfully submitted,

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Dated: FEBRUARY 6, 2004

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